



## MEMORANDUM

**To: Ed Warner, Bureau of Reclamation**  
**From: SJRRIP Biology Committee, Bill Miller, Chair**  
**CC: Joy Nicholopoulos, US Fish and Wildlife Service**

**Subject: San Juan River Base Flow-Guidance For Navajo Reservoir Operation**  
**Date: 7/16/02**

Maintaining a target base flow in the San Juan River below Farmington of 500 cfs is one of the flow recommendations of the SJRRIP Biology Committee<sup>1</sup>. The recommendation is for the purpose of optimizing backwater habitat, and to a lesser degree other low velocity habitat, to benefit endangered fish recovery. Maintaining the base flow near 500 cfs also conserves water to allow more frequent releases in the spring for habitat creation and maintenance. Modeling for testing of flow recommendations assumes a 500 cfs base flow during non-runoff periods as the basis for determining availability of water for peak releases.

Habitat has not been assessed below 500 cfs to quantify the impact of lower flows. The Biology Committee selected 500 cfs as the low end of the recommended range based on long-term mean base flows, visual observations of the river at lower flows and the desire to err on the safe side where data are not available.

The actual language of the recommended operating procedure<sup>2</sup> left some ambiguity as to intent. For example, during the summer, the flow at the Farmington gage is nearly always greater than the other gages due to downstream depletion and limited inflow. A strict interpretation would allow use of this gage and one other gage to determine compliance, resulting in substantially lower flow throughout the critical habitat. It is the intent of the recommendation to maintain this base flow throughout the habitat range. Allowing two gages to be averaged recognized the probability of gage error or missing data from any single gage. It was not the intent of the recommendation to

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<sup>1</sup> Target Base Flow (mean weekly non-spring runoff flow). Level: 500 cfs from Farmington to Lake Powell, with 250 cfs minimum from Navajo Dam. Purpose: Maintaining low, stable base flows enhances nursery habitat conditions. Flows between 500 and 1,000 cfs optimize backwater habitat. Selecting flows at the low end of the range increases the availability of water for development and spring releases. It also provides capacity for storm flows to increase flows and still maintain optimum backwater area. This level of flow balances provision of near-maximum low-velocity habitat and near-optimum flows in secondary channels, while allowing water availability to maintain the required frequency, magnitude, and duration of peak flows important for Colorado pikeminnow reproductive success.

<sup>2</sup> Actual language from the flow recommendation report: Target base flow (average weekly) following spring peak is 500 cfs at Farmington, Shiprock, Four Corners, and Bluff gages, measured as the average of any two of these gages. Minimum release is 250 cfs. The target flow should be maintained between 500 and 600 cfs, attempting to maintain target flow closer to 500 cfs.

have all four gages above 500 cfs weekly average all the time, but to allow some judgement on the part of dam operators to meet the intent of maintaining 500 cfs in the bulk of the habitat.

Further assessing the gages as to representation of conditions in the reach suggests that the Bluff and Four Corners gages would be the primary gages most of the summer as they represent the bulk of the important backwater habitat. The Shiprock gage is often depressed due to hogback diversions and the lack of return flows which come back just downstream of the gage. It therefore represents only about 10 miles of river during the irrigation season. During the winter months, the upper two gages may actually show lower flow than the lower gages as inflows downstream of Farmington increase flows down-river. To more closely meet the intent of the flow recommendation it is proposed that the following procedure be used:

Use the lesser of the average of Bluff, Four Corners and Shiprock and the average of Farmington, Shiprock and Four Corners. If one or more of the gages is missing or is obviously providing incorrect data, use the remaining gages in the set. Extreme conditions (low or high flows) identified by the Bureau of Reclamation will be handled on a case-by-case basis with recommendations from the Biology Committee.

This recognizes variability in actual flow and gage accuracy in the habitat range and will maintain the average flow in the habitat range above 500 cfs, although some short reaches may be a bit lower than 500 cfs. It is less subjective and less subject to argument.



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